



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/329,889	06/10/1999	STEPHANE BOUSSAC	005974/00011	8734
27383	7540	12/14/2004	EXAMINER	
CLIFFORD CHANCE US LLP 31 WEST 52ND STREET NEW YORK, NY 10019-6131			THANGAVELU, KANDASAMY	
			ART UNIT	PAPER NUMBER
			2123	
DATE MAILED: 12/14/2004				

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/329,889

Applicant(s)

BOUSSAC ET AL.

Examiner

Kandasamy Thangavelu

Art Unit

2123

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 2 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 08 September 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☒ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 25,28,30,31,33,35,36 and 38-42 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 25,28,30,31,33,35,36,38 and 40-42 is/are allowed.
- 6) ☐ Claim(s) \_\_\_\_\_ is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 September 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input checked="" type="checkbox"/> Other: <u>Examiner's amendment</u> .             |

## **DETAILED ACTION**

### ***Introduction***

1. This communication is in response to the Applicants' Amendment dated September 8, 2004. Claims 39-42 were added. Claims 25, 28, 30-31, 33, 35-36 and 38-42 of the application are pending. This office action is Ex parte Quayle action.

### ***Response to Arguments***

2. Applicants' amendments and arguments filed on September 8, 2004 have been fully considered in light of the Attorney's interview with the Examiner and the Primary Examiner Sam Broda on August 25, 2004. The presentation by the attorney on August 25, 2004 has enabled better understanding of the methodology of the invention and the definition of various terms used in the specification. The presentation materials and the specification have been carefully reviewed. It is decided that the claim rejections under 35 U.S.C. 112 First Paragraph can be overcome by rewriting a few paragraphs in the specification to better state the definitions and replacing Figure 6 in the drawings with a set of figures from the presentation to explain the methodology in more detail. The recommended rewrites to the specification paragraphs are presented in Paragraph 7 below. The figures to be inserted in place of Figure 6 in the drawings are presented in Paragraph 6 below.

***Examiner's Amendment***

3. Authorization for this examiner's amendment was given in a telephone interview with Mr. James Mahon on December 4, 2004.

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

4. The application has been amended as follows:  
Claim 39 deleted.

***Prosecution on merits is closed***

5. The application is in condition of allowance except for the formal matters described in Paragraphs 6 and 7 below. Prosecution on merits is closed in accordance with the practice under Ex parte Quayle, 1935 C.D.11, 453 O.G. 213.

A shortened statutory period for reply to this office action is set to expire TWO MONTHS from the mailing date of this letter.

### ***Drawings***

6. Acknowledgement is made of receipt of new drawings for Figures 11-14 on September 8, 2004.

Modifications to the drawings to be made are as follows:

1. Deleted Figure 2.
2. Renumber Figures 3 to 5 consecutively.
3. Delete Figure 6.
4. Insert figure entitled "First Example, translation" from interview as Figure 5.
5. Insert Figure entitled "selection of edges and their traces in the first Zone" from interview as Figure 6.
6. Insert Figure entitled "First zone of an edge: comprises ..." from interview as Figure 7.
7. Insert Figure entitled "edge not moving in the first zone" from interview as Figure 8.
8. Insert Figure entitled "resulting set of kept traces" from interview as Figure 9.
9. Insert Figure entitled "Triangle moving in second zone" from interview as Figure 10.
10. Insert Figure entitled "selection of triangles moving in second Zone" from interview as Figure 11.

Art Unit: 2123

11. Insert Figure entitled "Resulting set of kept triangles" from interview as Figure 12.
12. Insert Figure entitled "resulting swept volume" from interview as Figure 13.
13. Renumber Figures 7 to 14 starting with new Figure number 14.

### ***Specification***

7. The following rewrites are required in the specification:

Change Page 1, Para 2, Line 2, "or total area a moving part will occupy"  
to  
"or total volume a moving part will occupy".

Change Page 1, Para 3, Lines 4-5, "Acceptable quality using his techniques"  
to  
"Acceptable quality using these techniques".

Change Page 2, Para 2, Lines 3-6, "With this invention a subset of free neighborhood entities can be determined for each matrix and traces of motion of the free neighborhood entities can be generated. A representation of the swept volume from the traces can be constructed. Free neighborhood entities can include for example, an edge or a triangle."

Art Unit: 2123

to

“With this invention a subset of entities can be determined for each matrix and traces of motion of the entities can be generated. A representation of the swept volume from the traces can be constructed. The entities can include for example, an edge or a triangle.”

Insert a definition of free neighborhood after Page 2, Paragraph 2 as:

Free neighborhood is an area in which an entity can move, while remaining on the swept volume boundary.

Rewrite Page 2, Para 3 as follows:

When an edge of a three dimensional polyhedron moves within two portions of a sphere limited by planes of adjacent triangles that meet at the edge, the sphere being outside the material of the object and adjacent to the object, it is in an area in which the edge can move while remaining on the swept volume boundary. Such portions of the sphere are called tangent zones. When a triangle of a three dimensional polyhedron moves within the material of the object which is limited by a plane of the triangle and the half sphere containing the material of the object, the half sphere defined by the circumscribing circle of the triangle, the triangle is in a space in which the triangle can move while being on the swept volume boundary. Such space is called material zone. Free neighborhood of a polyhedral object includes tangent zones and material zones, traced by some of the edges and triangles on the polyhedron. Such edges and

Art Unit: 2123

triangles are called free neighborhood entities. The swept volume of a polyhedral object can be defined by the tangent zones and the material zones traced by the free neighborhood entities of the polyhedral object.

Change Page 2, Para 7, Line 4, "or total area a moving part will occupy"

to

"or total volume a moving part will occupy".

Page 3: Rewrite BRIEF DESCRIPTION OF DRAWINGS to reflect the new set of drawings as described in Paragraph 4 above.

In Page 5, delete Paragraphs 2 and 3.

Rewrite Page 6, Para 2 as follows:

... At a time  $t$ , a point belonging to a boundary of a moving object belongs to the boundary of the swept volume, if the point is not inside the material of the object. For a point  $p$ , a free neighborhood can be a set of points if the neighborhood generated from the motion of point  $p$  is not inside the material of the object.

In Page 7, Para 4, change "a polygon 410 can be submitted to a translation"

to

"a polygon 410 can be subjected to a translation"



Rewrite Page 7, Para 5 as follows:

Referring to Fig. 5, a free neighborhood can be represented by an angular portion of a sphere for edge types of entities belonging to the boundary of the polygon. Such a free neighborhood can be based on tangent vector 531 and side 541 or tangent vector 532 and side 542 of edge 520. This is tangent zone. In the case of a triangle, a free neighborhood can be based on the plane of the triangle and the half sphere in the material of the object. This is material zone.

Rewrite Page 7, Para 6 as follows:

The free neighborhood of a triangle of the 3-D object can be represented by a half sphere 510 containing ....

Delete Page 7, Para 7 and add brief descriptions for new Figures 5 to 13.

In new Figures 14 to 21, change the numbering of various items to reflect the new figure numbers. Update the specification Pages 7-10, to reflect the new Figure numbers and the numbers for the various items.

In the new Figure entitled, "Resulting swept volume", two lines cross inside the swept volume. The same is shown in the old Fig. 9. Describe briefly, how this portion

Art Unit: 2123

of the lines inside the swept volume is deleted, while describing the new Figure entitled, "Resulting swept volume".

### ***Conclusion***

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dr. Kandasamy Thangavelu whose telephone number is 571-272-3717. The examiner can normally be reached on Monday through Friday from 8:00 AM to 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kevin Teska, can be reached on 571-272-3716. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

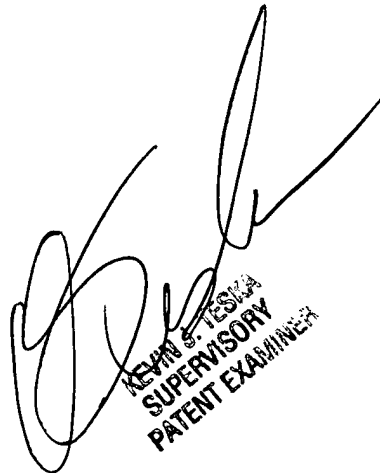
Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-9600.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should

Art Unit: 2123

you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

K. Thangavelu  
Art Unit 2123  
December 4, 2004



KEVIN S. TESLA  
SUPERVISORY  
PATENT EXAMINER